King County International Airport
Drainage Basin # 5 Source Control Report

January 7, 2009

Prepared for the Washington State Department of Ecology

by the

Airport Engineering Section
King County International Airport Division
King County Department of Transportation

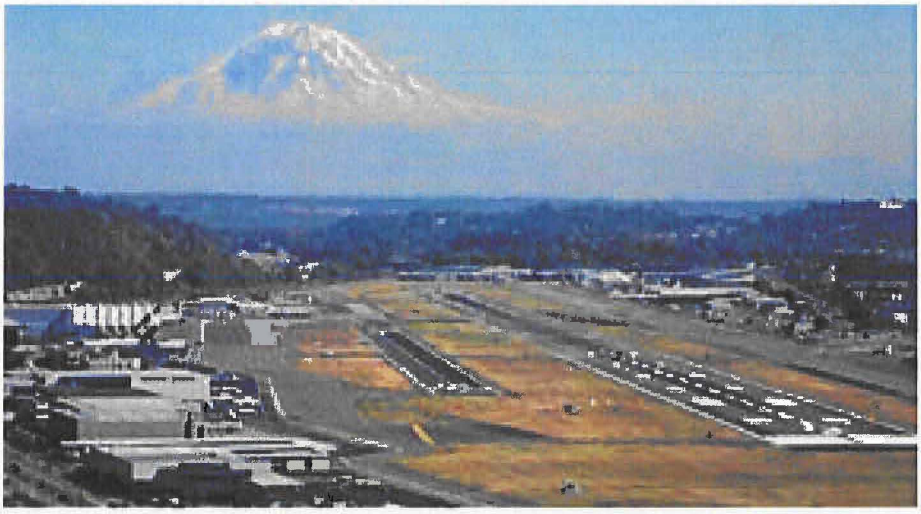


Table of Contents

Figures

Appendices

Introduction

King County International Airport/Boeing Field (Airport) is a general aviation airport that is owned and operated by King County. The total Airport area is approximately 615 acres of which 435 are impervious, covered by buildings and paving. The remaining 180 acres include grass and landscaping.

The Airport's stormwater system includes 15 miles of pipe. Additionally, there are two pump stations, north and south, that lift and pump stormwater to Discharge Points #1 and #2, respectively. There are also three gravity-drained stormwater discharge points (#3, #4, and #5) that drain the southern and west-central portions of the Airport. Additional stormwater structures include twenty-three oil/water separators, two wet-vaults, a Storm Filter system, and a stormwater retention system. A map of the Airport's stormwater system is provided at **Figure 1**. A larger version of this map is also included with the report.

Several off-Airport stormwater sources (Associated Grocers, railroad right-of-way, City of Seattle and others) discharge into the Airport's stormwater system. Other non-Airport owned properties (Boeing Company, Museum of Flight and City roads) contribute stormwater to Discharge Points #3 and #4. Portions of the Airport along East Marginal Way South discharge into a combination of Boeing and City of Tukwila stormwater systems.

Several businesses lease land and buildings from the Airport. The Boeing Company (North Boeing Field) leases about 118 acres while the other tenants lease a total of 152 additional acres. Tenant activities include passenger airline service, aircraft manufacturing, aircraft maintenance, aircraft storage, aviation education, aviation related retail and ground service of aircraft. Other non-aviation activities include storage, light manufacturing and a plant nursery.

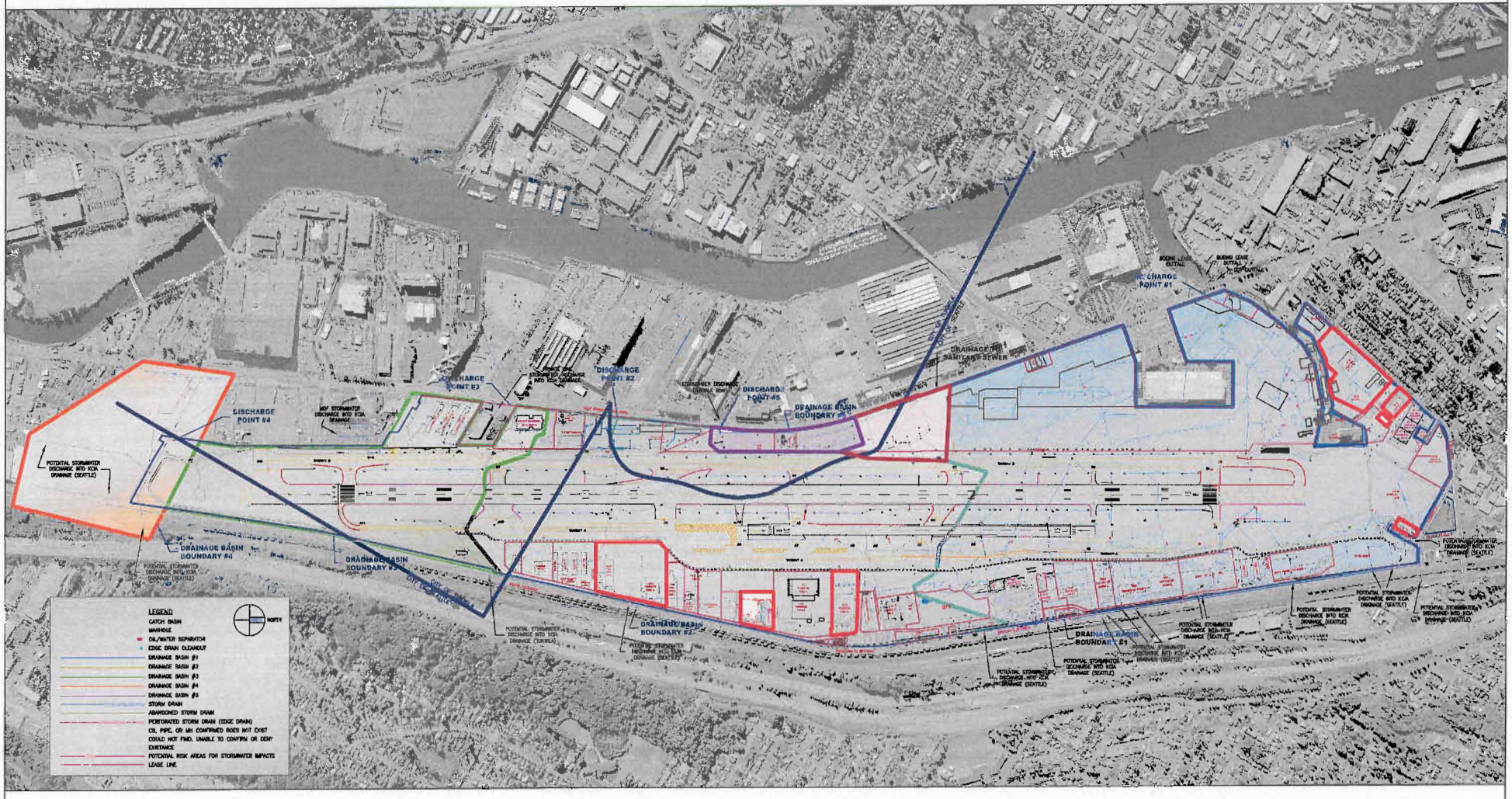
Source control activities are performed at the Airport in accordance with requirements under several permits and mandates, including:

- US Environmental Protection Agency (EPA) Lower Duwamish Waterway Superfund Cleanup
- Federal Aviation Administration (FAA) Federal Aviation Regulations (FAR) Part 139
- National Pollutant Discharge System (NPDES) Phase I Municipal Stormwater Permit
- Airport and tenant Industrial Stormwater NPDES Permits
- Construction Stormwater NPDES Permits

The EPA is leading the sediment contamination investigation for the Lower Duwamish Waterway Superfund Cleanup with support from the Washington State Department of Ecology (Ecology). Ecology has taken the lead to control upland sources of sediment pollution in the Lower Duwamish Waterway (LDW) in cooperation with the City of Seattle, the Port of Seattle, King County, the City of Tukwila, and EPA. Ecology also leads the interagency Source Control Work Group (SCWG), which shares information, discusses strategy, develops action plans, implements source control measures, and tracks the progress of source control work in the Lower Duwamish. Final decisions on source control actions and the completeness of source control tasks are made by Ecology, in consultation with EPA, as outlined in the April 2002 Ecology/EPA LDW Memorandum of Understanding.

Other source control activities at the Airport include, but are not limited to, site mapping, source identification, monitoring, implementation of best management practices (BMPs), stormwater system maintenance, and reporting.

The Airport and its tenants have addressed source removal at Drainage Basin #5 primarily through street sweeping and catch basin cleaning as explained in Chapter 3 and 5. Additional source removal will be addressed through source identification and monitoring activities. The Airport has successfully cleaned stormwater facilities related to Early Action Area 3 (Slip 4) Activities and as part of general stormwater system maintenance activities.



KING COUNTY INTERNATIONAL AIRPORT
SEATTLE, WASHINGTON

AIRPORT STORMWATER DRAINAGE SYSTEM MAP
Drainage Basin #5 Source Control Report

SCALE 1"=400' | DRAWN BY: MH | DATE 1/8/09 | SHEET NUMBER Figure 1

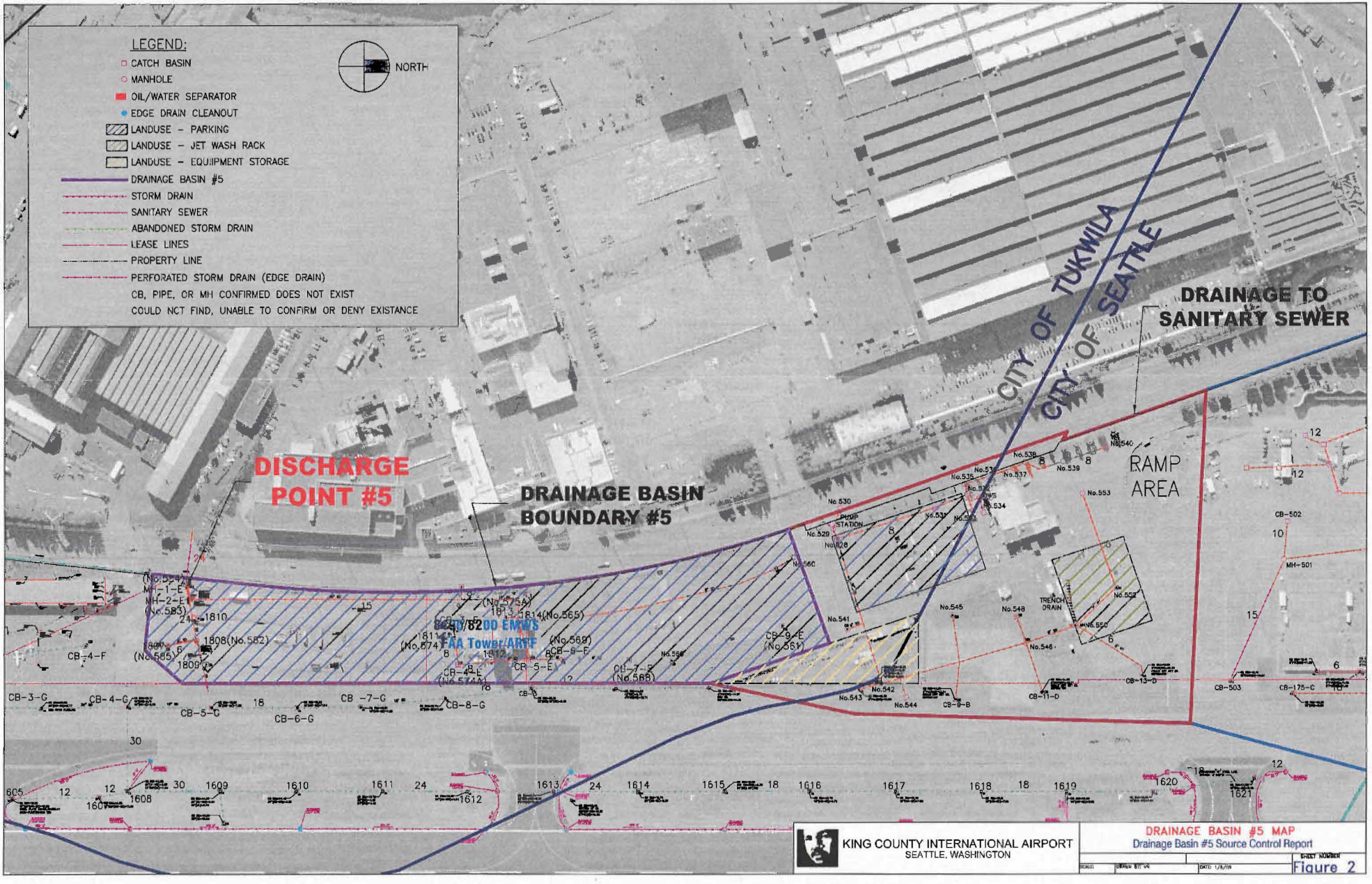
Chapter 1 – Drainage Basin #5

Drainage Basin #5 (Basin 5) consists of 10.5 acres located at the west side of the Airport. It includes both leased and unleased areas. The basin is comprised primarily of impervious surfaces and is relatively flat. Stormwater is collected by catch basins and channel drains and is directed in a southerly direction through a system of pipes and manholes. Stormwater leaves Airport property at manhole MH-1-E (Catch Basin No. 584[1]), located at the southwest corner of the basin at Discharge Point #5, where it discharges to the City of Tukwila stormwater system at East Marginal Way South. The Basin 5 Stormwater Map is provided at **Figure 2**. A larger version of this map is included with this report.

Uses within Basin 5 include the Federal Aviation Administration (FAA) Control Tower and North Boeing Field (NBF). The southern portion of the basin is general Airport parking. The central portion includes Control Tower and Airport Aircraft Rescue and Firefighting Station (ARFF) parking. The northern portion is NBF general parking.

The size of Basin 5 is revised downwards from previous versions of the Airport's stormwater system maps. The revision is based on drawings provided by Boeing showing that stormwater from the northern portion of Basin 5 area, which includes Boeing's Fire Unit, aircraft washpad, and equipment storage areas, is routed to the sanitary sewer and not conveyed to Discharge Point #5.

[1] Boeing has identified stormwater structures within their leasehold by the convention of "No. ###", as in Catch Basin No. 584, Channel Drain No. 578. For ease of reference, we identify each facility by both the KCIA and the Boeing identifier.


LEGEND:
CATCH BASIN
MANHOLE
OIL/WATER SEPARATOR
EDGE DRAIN CLEANOUT
LANDUSE – PARKING
LANDUSE – JET WASH RACK
LANDUSE – EQUIPMENT STORAGE
DRAINAGE BASIN #5
STORM DRAIN
SANITARY SEWER
ABANDONED STORM DRAIN
LEASE LINES
PROPERTY LINE
PERFORATED STORM DRAIN (EDGE DRAIN)
CB, PIPE, OR MH CONFIRMED DOES NOT EXIST
COULD NOT FIND, UNABLE TO CONFIRM OR DENY EXISTANCE
NORTH
DISCHARGE POINT #5
DRAINAGE BASIN BOUNDARY #5
CITY OF TUKWILA
CITY OF SEATTLE
DRAINAGE TO SANITARY SEWER
RAMP AREA
DO EMWS
FAA Tower/ARTF
PUMP STATION
TRENCH DRAIN
KING COUNTY INTERNATIONAL AIRPORT
SEATTLE, WASHINGTON
DRAINAGE BASIN #5 MAP
Drainage Basin #5 Source Control Report
Figure 2

Chapter 2 – Existing Monitoring Data

Existing monitoring data from Basin 5 includes information on polychlorinated biphenyl (PCB) monitoring data from stormwater system sediment samples collected by both the Airport and Boeing. Other Basin 5 data address turbidity, pH, and temperature from samples taken in connection with inspections for illicit discharges under the NPDES Phase I municipal stormwater permit and discharges authorized under an NPDES construction permit.

Sediment Data

The Airport, as a member of the Lower Duwamish Source Control Work Group, participates in the cleanup of the Lower Duwamish Waterway Superfund Site. With EPA, Ecology, the City of Tukwila, Boeing, and Jorgensen Forge, it has been involved in source control activities related to the Early Action Area 4 (EAA4) Source Control Area, which includes Basin 5.

In accordance with Ecology's EEA4 Source Control Action Plan (SCAP) dated December 2007, the following action items were assigned to the Airport:

1. Investigate drainage system connections
2. Provide PCB data to determine the need for additional monitoring
3. Test for PCBs and remove, as needed, if elevated PCBs were detected. Review and make revisions, as needed, to the Airport's Stormwater Pollution Prevention Plan

Source Control Action Items for the Airport are provided in **Appendix 1**. Action Items for other parties related to the EAA4 are also listed.

In an effort to address these items, the Airport provided a letter to Ecology in May of 2008. This letter is provided as **Appendix 2** and includes 2001and 2005 PCB data from Basin 5 catch basin sediment and joint caulk samples. The 2001 PCB data showed that for all joint caulk and sediment samples collected, PCB concentrations were below MTCA Level A Standards of 1 mg/kg (ppm). The 2005 PCB data showed total PCB concentrations in sediments and joint caulk ranging from 0.14 to 2.67 mg/kg. Exceedences to the MTCA standard were observed in one of three joint caulk samples and Trench 2 sediments. In comparison, total PCB concentrations in sediments collected from manholes in the 24" stormwater pipe downstream of the Airport on Jorgensen property (the Pipe) ranged from 68 to 10,000 mg/kg.

The forms or types of Aroclors in the PCBs were also analyzed. It appeared that the 24" stormwater pipe sediments were contaminated predominately by Aroclor 1254. The slightly elevated levels at the Airport, in the North Boeing Field lease area, were of the Aroclor 1260 type. This suggests different sources for the contamination in the Pipe and at the Airport.

The 2001 PCB Report, prepared by the IT Group, and the 2005 PCB Report, prepared by PES Consultants, are provided at **Appendix 3**. The Ecology EAA4 SCAP PCB Data Map showing data from the Pipe is also provided.

On August 27, 2008, the Airport provided Ecology with a report by Landau Associates (**Appendix 4**) containing Boeing PCB data from 1997 to 2000. The report included data from both Airport and Boeing lease area. This data showed that sediment from the last catch basin in the Airport system (MH-1-E) had Total PCB concentrations that ranged from 31-128 mg/kg with Aroclor 1254 predominating. In 2000, an elevated level of Aroclor 1260 (85 mg/kg) was detected at MH-1-E (CB-584), however, in 1997 and 1998, sediment samples showed no detection of PCBs. Moreover, the catch basin upgradient of MH-1-E (MH-

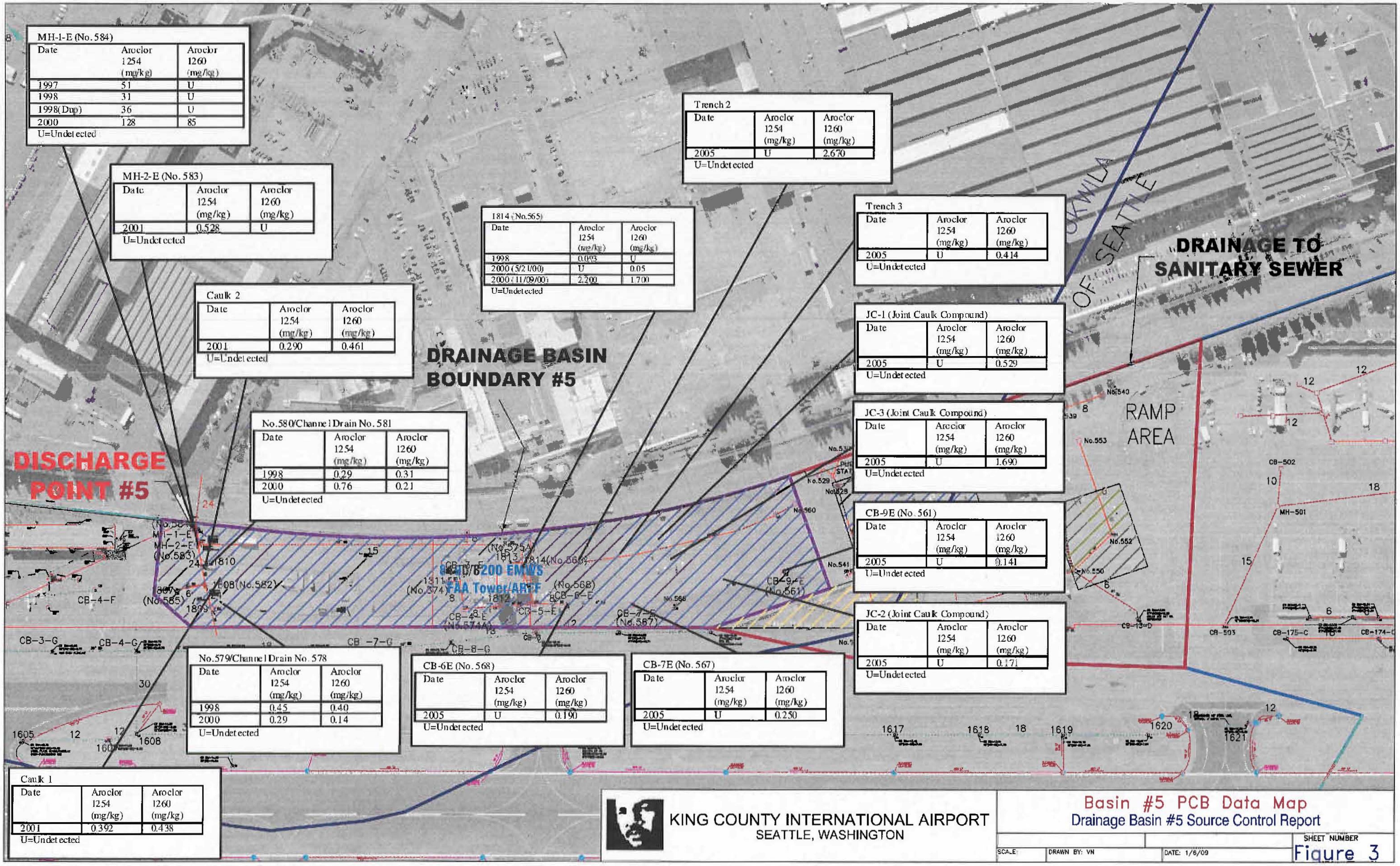
2-E) showed no detected levels of PCBs in 2001. The PCB concentrations found further upgradient at the Airport (NBF lease area) were of the Aroclor 1260 and where Aroclor 1254 was not detected.

Based on these data, it appears that the plume of Aroclor 1254 contamination in the Lower Duwamish Waterway associated with the Pipe is likely associated with contamination released into the Pipe down gradient from the Airport from those private properties. The elevated PCB concentrations in MH-1-E at East Marginal Way are caused by the tide moving PCBs upgradient through the Pipe into the Airport stormwater system. A recent City of Tukwila 2008 PCB report (**Appendix 5**) addresses the potential upgradient migration of PCBs from the Pipe resulting from tidal influence.

A map showing areal and temporal distribution of PCB data in Basin 5 is also provided in **Figure 3**, which shows the results of catch basin, trench, and caulk PCB analysis. The results at MH-1-E are 1 to 2 orders of magnitude higher than all other sediment and caulking results, further suggesting off-airport sources for the contamination at MH-1-E. A larger version of this map is included with the report.

Stormwater Data

Stormwater discharge data is available from an Illicit discharge investigation conducted in June 2008 and from weekly stormwater monitoring required for a construction NPDES stormwater permit. Both sets of data include turbidity, pH, and temperature data. The data summaries are provided in **Appendix 6**. Boeing has no stormwater data from their leased portion of Basin 5.



MH-1-E (No. 584)

Date	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)
1997	51	U
1998	31	U
1998(Dup)	36	U
2000	128	85

U=Undetected

MH-2-E (No. 583)

Date	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)
2001	0.528	U

U=Undetected

Caulk 2

Date	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)
2001	0.290	0.461

U=Undetected

1814 (No.565)

Date	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)
1998	0.093	U
2000 (5/21/00)	U	0.05
2000 (11/09/00)	2,200	1700

U=Undetected

Trench 2

Date	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)
2005	U	2.670

U=Undetected

Trench 3

Date	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)
2005	U	0.414

U=Undetected

JC-1 (Joint Caulk Compound)

Date	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)
2005	U	0.529

U=Undetected

JC-3 (Joint Caulk Compound)

Date	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)
2005	U	1.690

U=Undetected

No.580/Channel Drain No. 581

Date	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)
1998	0.29	0.31
2000	0.76	0.21

U=Undetected

CB-9E (No. 561)

Date	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)
2005	U	0.141

U=Undetected

JC-2 (Joint Caulk Compound)

Date	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)
2005	U	0.171

U=Undetected

No.579/Channel Drain No. 578

Date	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)
1998	0.45	0.40
2000	0.29	0.14

U=Undetected

CB-6E (No. 568)

Date	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)
2005	U	0.190

U=Undetected

CB-7E (No. 567)

Date	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)
2005	U	0.250

U=Undetected

Caulk 1

Date	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)
2001	0.392	0.438

U=Undetected

KING COUNTY INTERNATIONAL AIRPORT
SEATTLE, WASHINGTON

Basin #5 PCB Data Map
Drainage Basin #5 Source Control Report

SCALE: | DRAWN BY: VN | DATE: 1/6/09 | SHEET NUMBER Figure 3

Chapter 3 – Operations and Maintenance Plan

Operations and maintenance at Basin 5 includes both Airport and tenant operations and maintenance plans and procedures. The maintenance of unleased areas at the Airport is performed in accordance with the Airport's Water Quality Best Management Practices and FAA's Part 139 Regulations. The Airport is also responsible for maintenance at the FAA Control Tower area consistent with maintenance provisions provided in that lease. North Boeing Field (NBF) performs maintenance in accordance with their Industrial Stormwater NPDES Permit and Stormwater Pollution Prevention Plan.

Maintenance of All Unleased and Some Leased Areas

The Airport Maintenance Section is responsible for performing scheduled maintenance activities at all unleased and some leased areas. Stormwater related maintenance activities include street sweeping, catch basin cleaning, stormwater facility maintenance, oil-water separator inspection and maintenance, spill response, snow and ice removal, and vegetation management. Maintenance staff or professional contractors perform these activities.

Maintenance that occurs at Basin 5 primarily includes street sweeping, catch basin cleaning, and spill response. Maintenance requirements are documented in the following documents:

- Airport Water Quality Best Management Practices
- Airport Certification Manual
- Airport Spill Response Policy

The Airport Water Quality Best Management Practices was a document first developed in October 2006 and finalized in 2007. The document was drafted in compliance with King County's Phase I Municipal NPDES Permit and addresses the protection of water quality in areas not covered by an Industrial NPDES Permit.

Catch basin, wet well, and oil/water separator (OWS) cleaning are addressed on page 7 under Scheduled Activities (**Appendix 7**). Catch basins and wet wells are cleaned annually and OWS are cleaned annually or more frequently. OWS are inspected weekly by Airport Maintenance for sheen and oil boom replacement. Catch basins are cleaned by professional contractors.

The Airport is a Class II certificated commercial service airport. The Airport Certification Manual is maintained by the Airport to document its compliance with FAA requirements, Federal Aviation Regulations (FAR) Part 139, and information circulars. Per Section 305 – Paved Areas, Items 4 and 5, of the manual, Airport Maintenance performs daily street sweeping at several areas of the Airport. **Appendix 8** provides an excerpt of the FAR Part 139 regulations and associated section of the Airport Certification Manual. Also included is a listing of work orders, which identifies sweeping work orders in Basin 5 for the ARFF Station Vehicle Parking (5520), Lot 13 South of Tower (5518) and Tower Vehicle Parking (5517). Airport Maintenance performs mechanical street sweeping.

Airport Spill Response Policy and Procedures (**Appendix 9**) documents responsibilities, notification, response, cleanup and reporting requirements for spills. Spill Response is performed by AARF, Airport Operations and Maintenance, and Tenants on an as need basis. Spills that potentially affects the Airport's stormwater drainage system are reported to Ecology within 24 hours of such incidents.

North Boeing Field Maintenance

Boeing is responsible for performing scheduled maintenance activities at all areas within the North Boeing Field Leasehold. Boeing's stormwater system maintenance activities are performed in accordance with the site's Stormwater Pollution Prevention Plan (SWPPP) required by Industrial Stormwater NPDES Permit #SO3000226. Primary maintenance activities at Basin 5 include street sweeping, catch basin cleaning, and spills response.

Pursuant to Section 4.0 Best Management Practices (BMPs) of the North Boeing Field SWPPP (**Appendix 10**):

- Catch basins and OWS are cleaned as needed, but at a minimum of once every year.
- Parking lots, tarmacs, open manufacturing support areas, and other open impervious surfaces are mechanically swept on a regular schedule according to priorities.
- Inspections are performed based on areas and in accordance with written procedures and schedules.
- Spills response is performed in accordance with the NBF Spill Prevention, Control and Countermeasures (SPCC) Plan.

Specific inspection schedules, priority lists, or SPCC or other plans are available and will be provided to Ecology upon request.

Chapter 4 – Monitoring Plan

Because the Airport is in compliance with the EAA4 SCAP source control action items, additional sediment or stormwater monitoring at Basin 5 has not been required to date. However, the Airport is voluntarily supporting efforts to gain information about PCBs in its system. It has provided access to Seattle Public Utilities (SPU) to install three additional inline sediment traps on Airport property. On September 25, 2008, SPU installed in-line sediment traps at manholes associated with Discharge Points # 3, #4, and #5. These and two existing SPU inline sediment traps in Drainage Basin #1 (Slip 4) will be monitored on a quarterly basis. SPU or their contractor will monitor the traps in accordance with SPUs Inline Sediment Traps Standard Operating Procedures (**Appendix 11**). The Inline Sediment Traps SOP is still in the process of revision.

The airport has also provided access to the King County Wastewater Treatment Division (WTD) to monitor and sample stormwater at MH-1-E (No. 584—Discharge Point #5) in connection with the Duwamish River Basin Combined Sewer Overflow Survey. The purpose of the survey is to understand the baseline levels of certain chemicals and conventional parameters in the Duwamish Basin Combined Sewer Overflow (CSO) system. Sampling and analyses will be performed in accordance with the Draft Duwamish River Basin CSO Sampling Plan (**Appendix 12**). Should additional stormwater monitoring be required, the Airport will have additional support by other King County departments/divisions such as the Stormwater Services Section.

Boeing has no sediment or stormwater monitoring planned for their portion of Basin 5.

Chapter 5 – Source Control

Source control at Basin 5 is being performed in accordance with the Lower Duwamish Waterway Cleanup activities and Phase I Municipal NPDES Permit Requirements.

As part of the Lower Duwamish Waterway cleanup and SCAP action items, the Airport has provided Ecology with the following information:

- The interconnection between Basin 5 and the City of Tukwila stormwater system at East Marginal Way South
- Airport and Boeing PCB data from sediments collected from catch basins, trench drains, and joint caulk material.

The Airport continues to be involved with the Lower Duwamish Waterway Source Control Work Group to share information, discusses strategies, develop and review action plans, implement source control measures, and track progress. Progress of Lower Duwamish source control activities are provided in Source Control Status Reports. The most recent report (April to August 2008 Activities) is available at the following link: http://www.ecy.wa.gov/biblio/0809068.html

Airport source control activities related to Phase I Municipal NPDES Permit (Permit) compliance include the following:

- Performing tenant assessments and inspections to obtain information on potential pollutant generating sources (PPGS), existing BMPs, and maintenance activities. Tenant assessment summaries/letters are sent to tenants to address PPGS issues and discussed implementation of additional BMPs.
- Performing Illicit Discharge Detection and Elimination (IDDE) inspections to determine sources of illicit connections, improper dumping, and spills.
- Updating Airport spill and de-icing policies.
- Ensuring operations and maintenance activities are scheduled and adhere to the Airport Water Quality BMPs.
- Updating lists of tenants with Industrial and Constructions Stormwater NPDES Permits.
- Maintaining current versions of Airport and tenant Stormwater Pollution Prevention Plans.
- Activities in accordance with King County's Stormwater Management Plan (SWMP).
- Reporting as required by the Permit.

On June 2, 2008, the Airport conducted a tenant assessment at North Boeing Field. All PPGS were covered by the Boeing's SWPPP. On July 15, 2008, the Airport conducted a tenant assessment for the FAA Control Tower. PPGS of concern include potential spills and leaks from an above ground fuel tank and from fueling activities. Tenant assessments are provided in **Appendix 13**. With regard to status of these assessments, tenant assessment letters were sent to Boeing and FAA to address the potential for spills and leaks. The tenants have become aware and will adhere to the Airport's Spill Response Policy.

The Airport has also been involved in Phase I Municipal Permit meetings to ensure compliance with King County's SWMP and Permit. The meetings are convened by King County's Phase I Municipal Permit Coordinator and includes representatives from several King County departments/divisions.

Chapter 6 – Reporting

The Airport will be utilizing the Airport Engineering Section as the primary point of contact. Peter Dumaliang will gather, analyze, and finalize all maintenance, monitoring, and source control data before dissemination. Sources of this information will be gathered from Airport departments, tenants, consultants, and contractors.

Final stormwater reports, maps, analytical, and other stormwater-related data will be disseminated to King County's Phase I Municipal Permit Coordinator in accordance with permit requirements. SCAP reports and other deliverables will be submitted to Ecology's EEA4 Site Manager based on SCAP timelines. As needed, all final documents and data will also be available to Ecology upon request.

These are interim reporting procedures and shall be revised as needed.

Appendix 1 – Early Action Area 4 Source Control Action Plan (SCAP) Items

Appendix 2 – May 2008 King County International Airport Letter to Ecology on SCAP Items

Appendix 3 – 2001 & 2005 Airport PCB Reports and Data

Appendix 4 – Boeing 1997-2000 PCB Report and Data

Appendix 5 – PCB Source Control Investigation of the City of Tukwila Stormwater System

Appendix 6 – June 2008 Illicit Discharge Investigation and Taxiway Bravo Rehabilitation Project Stormwater Data Summaries for MH-1-E Discharge Location

Appendix 7 – Airport Water Quality Best Management Practices

Appendix 8 – Excerpt of FAA FAR Part 139 Regulations and Associated Section of the Airport Certification Manual

Appendix 9 – Airport Spill Response Policy and Procedures

Appendix 10 – North Boeing Field Stormwater Pollution Prevention Plan, Section 4.0 Best Management Practices

Appendix 11 – Seattle Public Utilities Inline Sediment Traps Standard Operating Procedures

Appendix 12 – Duwamish River Basin CSO Sampling Plan

Appendix 13 – North Boeing Field and FAA Control Tower Tenant Assessments